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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/780,547	02/09/2001	William L. Betts	061607-1500	1557
24504	7590	06/23/2004	EXAMINER	
THOMAS, KAYDEN, HORSTEMEYER & RISLEY, LLP 100 GALLERIA PARKWAY, NW STE 1750 ATLANTA, GA 30339-5948			WANG, TED M	
			ART UNIT	PAPER NUMBER
			2634	4

DATE MAILED: 06/23/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

09/780,547

Applicant(s)

BETTS ET AL.

Examiner

Ted M Wang

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 09 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-32 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-32 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)  | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

### **DETAILED ACTION**

1. Claims 1-32 are pending in the application.

#### ***Preliminary Amendment***

2. The preliminary amendment filed on 4/12/2004 has been entered. The Applicant amends claims 1 and 22 and adds claims 31 and 32.

#### ***Claim Rejections - 35 USC § 102***

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1 –5, 7, 9-17, 20-25, 27, and 29-32 are rejected under 35 U.S.C. 102(b) as being anticipated by Betts (US6,137,829).

- In regard claim 1, Betts discloses a system and method for transmitting special marker symbols comprising a pulse amplitude modulation (PAM) transmitter (FIG.6 and column 5 line 43 – column 6 line 65); a fractional encoder associated with the PAM transmitter (Fig.17, and column 2 line 34 – column 3 line 2, and column 10 line 57 – column 11 line 32), the fractional encoder configured to encode a non-integer number of bits for each word to be transmitted by the PAM transmitter (Fig.17, and column 2 line 34 – column 3 line 2, and column 10 line 57 – column 11 line 32); and a constellation encoder configured to encode each

word containing the non-integer number of bits into a signal space constellation to be transmitted by the PAM transmitter, and where each signal space constellation comprises a symbol (column 2 line 34 – column 3 line 2, and column 10 line 57 – column 11 line 32).

- In regard claim 2, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 3, the limitation that the fractional encoder further comprises a modulus converter can further be taught in column 2 line 34 – column 3 line 2, and column 10 line 57 – column 11 line 32, and column 15 lines 15-44.
- In regard claim 4, the limitation that the fractional encoder further comprises a shell mapper can further be taught in column 15 lines 15-44.
- In regard claim 5, the limitation that the fractional encoder further comprises a shell mapper can further be taught in column 15 lines 19-44.
- In regard claim 7, the limitation that each symbol is transmitted using a multi-dimension signal space constellation can further be taught in column 15 lines 15-44.
- In regard claim 9, all limitation can further be taught in column 2 line 34 – column 3 line 2.
- In regard claim 10, all limitation can further be taught in Fig.17, column 2 line 34 – column 3 line 2, and column 10 line 57 – column 11 line 48.
- In regard claim 11, all the limitation can further be taught in Fig.18, Table II, and column 13 line 46 – column 14 line 55.

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- In regard claim 12, the limitation that the fractional decoder is a modulus converter can further be taught in column 3 lines 37-40 and column 11 lines 33-34, and column 13 lines 46-67.
- In regard claim 13, which is a method claim related to claim 1, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 14, which is a method claim related to claim 3, all limitation is contained in claim 3. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 15, which is a method claim related to claim 4, all limitation is contained in claim 4. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 16, which is a method claim related to claim 5, all limitation is contained in claim 5. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 17, which is a method claim related to claim 7, all limitation is contained in claim 7. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 20, which is a method claim related to claim 9, all limitation is contained in claim 9. The explanation of all the limitation is already addressed in the above paragraph.

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- In regard claim 21, which is a method claim related to claim 10, all limitation is contained in claim 10. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 22, which is a means function claim related to claim 1, all limitation is contained in claim 1. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 23, which is a means function claim related to claim 3, all limitation is contained in claim 3. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 24, which is a means function claim related to claim 4, all limitation is contained in claim 4. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 25, which is a means function claim related to claim 5, all limitation is contained in claim 5. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 27, which is a means function claim related to claim 7, all limitation is contained in claim 7. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 29, which is a means function claim related to claim 9, all limitation is contained in claim 9. The explanation of all the limitation is already addressed in the above paragraph.

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- In regard claim 30, which is a means function claim related to claim 10, all limitation is contained in claim 10. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 31, the limitation that the transceiver is a digital subscriber line (DSL) transceiver, a DSL modem, or a modem can further be taught in Fig.1 and column 3 lines 43-67.
- In regard claim 32, which is a means function claim related to claim 31, all limitation is contained in claim 31. The explanation of all the limitation is already addressed in the above paragraph.

***Claim Rejections - 35 USC § 103***

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 6, 8, 18, 19, 26, and 28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Betts (US6,137,829) in view of Wei (US6,606,355).

- In regard claim 6, Betts discloses all of the limitation as described in the above paragraph except specifically teaching that each symbol is transmitted using a single dimensional signal space constellation.

Wei discloses a channel coding in the presence of bit robbing that each symbol is transmitted using a single dimensional signal space constellation (column 18 line 56 – column 19 line 8) in order to facilitate the decoder to proceed without some type of re-synchronization if mistake is made in the receiver.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Betts' transmitter in view of Wei's disclosure in order to facilitate the decoder to proceed without some type of re-synchronization if mistake is made in the receiver.

- In regard claim 8, Betts discloses all of the limitation as described in the above paragraph except specifically teaching that the transmitter comprise a trellis encoder associated with the constellation encoder.

Wei discloses a channel coding in the presence of bit robbing comprising a trellis encoder associated with the constellation encoder (Fig.6 element 26 and Fig.7, and column 11 lines 14-45, and column 14 lines 33-67) in order to accommodate the bit-robbing phenomenon.

It would have been obvious to one of ordinary skill in the art at the time of the invention to modify Betts' transmitter in view of Wei's disclosure in order to accommodate the bit-robbing phenomenon.

- In regard claim 18, which is a method claim related to claim 6, all limitation is contained in claim 6. The explanation of all the limitation is already addressed in the above paragraph.



- In regard claim 19, which is a method claim related to claim 8, all limitation is contained in claim 8. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 26, which is a means function claim related to claim 6, all limitation is contained in claim 6. The explanation of all the limitation is already addressed in the above paragraph.
- In regard claim 28, which is a means function claim related to claim 8, all limitation is contained in claim 8. The explanation of all the limitation is already addressed in the above paragraph.

### ***Conclusion***

7. Reference US5,706,312 and 6,137,829 are cited because they are put pertinent to the transceiver or modem communication with PAM and fractional encoding. However, none of references teach detailed connection as recited in claim.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ted M Wang whose telephone number is (703) 305-0373. The examiner can normally be reached on 8:30 a.m. - 5:00 p.m..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Chin can be reached on (703) 305-4714. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 306-0377.

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Ted M Wang  
Examiner  
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Ted M. Wang

A handwritten signature in black ink, appearing to read 'Stephen Chin', with a large, stylized initial 'S' and a long, sweeping horizontal stroke at the end.

**STEPHEN CHIN**  
**SUPERVISORY PATENT EXAMINE**  
**TECHNOLOGY CENTER 2800**